



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,202	03/24/2004	Makoto Aoki	1213.43684X00	3725

24956 7590 01/25/2006

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 DIAGONAL ROAD
SUITE 370
ALEXANDRIA, VA 22314

EXAMINER

CONTINO, PAUL F

ART UNIT PAPER NUMBER

2114

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/807,202

Applicant(s)

AOKI, MAKOTO

Examiner

Paul Contino

Art Unit

2114

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: **Information Processing System and Method for Path Failover**

2. The disclosure is objected to because of the following informalities: on page 7 in line 15 the statement “server changeover section 123” is interpreted by the Examiner as being “server changeover section **123**”.

Appropriate correction is required.

Drawings

3. The drawings are objected to because Figure 2 #140 is labeled **1F** where **IF** is interpreted as appropriate. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the

appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 3,4, and 18 are objected to because of the following informalities:

In claim 3, line 11, the statement *the other errors* has an antecedent basis problem.

In claim 4, lines 9-10, the statement *the other errors* has an antecedent basis problem.

In claim 18, lines 18-19, the statement *said number of specified error-prone paths* has an antecedent basis problem.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 19-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Software [programs] may not be patented.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-9 and 11-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation **said information processing apparatus** in line 8. Line 3 states the plural **information processing apparatuses**. There is insufficient antecedent basis for this limitation in the claim. Claims 2-8 are rejected based upon their dependency to claim 1.

Claim 2 recites the limitation **said server changeover evaluation section** in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation **said server changeover evaluation section** in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation **specified types of errors** in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitation **said server changeover evaluation section** in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 8 recites the limitation **said server changeover evaluation section** in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 9 recites the limitation **said information processing apparatus** in line 8. Line 3 states the plural **information processing apparatuses**. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation **said server changeover evaluation section** in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation **said server changeover evaluation section** in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation **specified types of errors** in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 13 recites the limitation **said server changeover evaluation section** in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation **said changeover evaluation section** in lines 13-14. There is insufficient antecedent basis for this limitation in the claim. Claims 15-17 are rejected based upon their dependency to claim 14.

Claim 16 recites the limitation **said plurality of specified types of errors** in lines 4-5. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation **the number of detected errors** in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation **said error management table** in line 11. There is insufficient antecedent basis for this limitation in the claim.

Claim 19 recites the limitation **said changeover evaluation section** in lines 12-13. There is insufficient antecedent basis for this limitation in the claim. Claims 20-22 are rejected based upon their dependency to claim 19.

Claim 20 recites the limitation **said plurality of specified types of errors** in lines 4-5. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 10, 14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim (U.S. Patent No. 6,526,521) in view of PowerPath (PowerPath Version 3.0 Product Guide).

As in claim 1, Lim teaches of an information processing system having a storage having a physical device, and a plurality of information processing apparatuses which are selectively connected to said storage and request data input/output from said storage, said information processing system[s] requesting data input/output via a plurality of paths as communication channels to said storage, wherein said information processing apparatus comprises (*Fig. 1; column 6 lines 57-64, where computer system 20 is interpreted as an information processing system, hosts 22 are interpreted as information processing apparatuses, and pathways 24 are interpreted as a plurality of paths*):

an error detection section which detects an error occurred on a path according to a result of a data input/output request (*column 7 lines 18-51, column 8 lines 8-21, column 10 lines 7-17 and lines 65-67, and column 12 lines 38-40, where agents 30 detection of unavailable pathways are interpreted as path errors*);

a changeover evaluation section which detects occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on all paths (*column 8 lines 55-65 and column 15 lines 1-5, where cluster framework 28 is interpreted as a changeover evaluation section and host failover is interpreted as a changing of an information processing apparatus*); and

a changeover section which uses a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said storage (*column 15 lines 8-24*).

However, Lim fails to teach of a logical unit. PowerPath teaches of logical units assigned to a physical device (*page 2-6 figure 2-3*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the logical storage units as taught by PowerPath in the invention of Lim. This would have been obvious because the use of PowerPath is taught in the invention of Lim (*column 1 line 63*). Further, PowerPath offers a variety of benefits (*page 2-2*) to enhance the fault tolerance of the invention of Lim.

As in claim 10, Lim teaches of an information processing apparatus which is selectively connected to a storage having a physical device and requests data input/output via a path as a communication channel to said storage, said apparatus comprising (*Fig. 1; column 6 lines 57-64, where host 22 is interpreted as an information processing apparatus, and pathways 24 are interpreted as a plurality of paths*):

an error detection section which uses a result of a data input/output request to detect an error occurred on a path (*column 7 lines 18-51, column 8 lines 8-21, column 10 lines 7-17 and lines 65-67, and column 12 lines 38-40, where agents 30 detection of unavailable pathways are interpreted as path errors*);

a changeover evaluation section which detects occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on all paths (*column 8 lines 55-65 and column 15 lines 1-5, where cluster framework 28 is interpreted as a changeover evaluation section and host failover is interpreted as a changing of an information processing apparatus*); and

a changeover section which uses a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said storage (*column 15 lines 8-24*).

However, Lim fails to teach of a logical unit and logical paths. PowerPath teaches of logical units assigned to a physical device (*page 2-6 figure 2-3*) and logical paths (*page 2-6 line 2*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the logical storage units and logical paths as taught by PowerPath in the invention of Lim. This would have been obvious because the use of PowerPath is taught in the invention of Lim (*column 1 line 63*). Further, PowerPath offers a variety of benefits (*page 2-2*) to enhance the fault tolerance of the invention of Lim.

As in claim 14, Lim teaches of a control method of changing an information processing apparatus which requests data input/output from a storage having a physical device via a path as a communication channel to said physical device and is connected to said storage, said method comprising the steps of (*Fig. 1; column 6 lines 57-64, where host 22 is interpreted as an information processing apparatus, and pathways 24 are interpreted as a plurality of paths*):

detecting an error occurred on a path according to a result of a data input/output request (*column 7 lines 18-51, column 8 lines 8-21, column 10 lines 7-17 and lines 65-67, and column 12 lines 38-40, where agents 30 detection of unavailable pathways are interpreted as path errors*);

detecting occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence

Art Unit: 2114

of errors on all paths (*column 8 lines 55-65 and column 15 lines 1-5, where host failover is interpreted as a changing of an information processing apparatus*); and

using a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said physical device (*column 15 lines 8-24*).

However, Lim fails to teach of a logical unit and logical paths. PowerPath teaches of logical units assigned to a physical device (*page 2-6 figure 2-3*) and logical paths (*page 2-6 line 2*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the logical storage units and logical paths as taught by PowerPath in the invention of Lim. This would have been obvious because the use of PowerPath is taught in the invention of Lim (*column 1 line 63*). Further, PowerPath offers a variety of benefits (*page 2-2*) to enhance the fault tolerance of the invention of Lim.

As in claim 19, Lim teaches of a program to control an information processing apparatus which requests data input/output from a storage having a physical device via a path as a communication channel to said physical device, said program comprising (*Fig. 1; column 6 lines 57-64, where host 22 is interpreted as an information processing apparatus, and pathways 24 are interpreted as a plurality of paths*):

means for detecting an error occurred on a path according to a result of a data input/output request (*column 7 lines 18-51, column 8 lines 8-21, column 10 lines 7-17 and lines*

Art Unit: 2114

65-67, and column 12 lines 38-40, where agents 30 detection of unavailable pathways are interpreted as path errors);

means for detecting occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on all paths (*column 8 lines 55-65 and column 15 lines 1-5, where host failover is interpreted as a changing of an information processing apparatus*); and

means for using a determination result from [a] changeover evaluation section to change said information processing apparatus requesting data input/output from said storage (*column 15 lines 8-24*).

However, Lim fails to teach of a logical unit and logical paths. PowerPath teaches of logical units assigned to a physical device (*page 2-6 figure 2-3*) and logical paths (*page 2-6 line 2*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the logical storage units and logical paths as taught by PowerPath in the invention of Lim. This would have been obvious because the use of PowerPath is taught in the invention of Lim (*column 1 line 63*). Further, PowerPath offers a variety of benefits (*page 2-2*) to enhance the fault tolerance of the invention of Lim.

* * *

8. Claims 2, 5, 6, 9, 11, 12, 15, 16, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim in view of PowerPath, further in view of Shank et al. (U.S. Patent No. 6,145,028).

As in claim 2, the combined invention of Lim and PowerPath teaches of the limitations of claim 1, including an error detection section and a changeover evaluation section. However, the combined invention of Lim and PowerPath fails to teach of the remainder of the limitations of claim 2. Shank et al. teaches an error detection section specifies a type of said detected error (*column 7 lines 45-51*); and a server changeover evaluation section changes the number of paths as a criterion for changing said information processing apparatus according to said specified error type (*column 7 lines 45-55*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the type of error specification and number of path criterion as taught by Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

As in claim 5, the combined invention of Lim and PowerPath teaches of the limitations of claim 1, including an error detection section and a changeover evaluation section. However, the combined invention of Lim and PowerPath fails to teach of the remainder of the limitations of

claim 5. Shank et al. teaches an error detection section specifies a type of said detected error (*column 7 lines 45-51*); and a server changeover evaluation section uses a combination of said plurality of specified types of errors to determine whether or not to change said information processing apparatus (*column 7 lines 36-55, where it is interpreted that once the tally of error types reaches a threshold, the information processing apparatus will be changed*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the type of error specification and plurality of error types as taught by Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

As in claim 6, Shank et al. teaches said server changeover evaluation section uses a result of totaling scores defined for types of errors occurring on a path to determine whether or not to change said information processing apparatus (*column 7 lines 44-55*).

As in claim 9, Lim teaches of an information processing system having a storage having a physical device, and a plurality of information processing apparatuses which are selectively connected to said storage and request data input/output from said storage, said information processing system requesting data input/output via a path as a communication channel to said storage, wherein said information processing apparatus comprises (*Fig. 1; column 6 lines 57-64*,

where computer system 20 is interpreted as an information processing system, hosts 22 are interpreted as information processing apparatuses, and pathways 24 are interpreted as a plurality of paths):

a changeover evaluation section which detects occurrence of error on a specified number of paths to determine whether or not to change an information processing apparatus connected to said storage even before occurrence of errors on all paths (*column 8 lines 55-65 and column 15 lines 1-5, where cluster framework 28 is interpreted as a changeover evaluation section and host failover is interpreted as a changing of an information processing apparatus*); and

a changeover section which uses a determination result from said changeover evaluation section to change said information processing apparatus requesting data input/output from said storage (*column 15 lines 8-24*).

However, Lim fails to teach of a logical unit, specifics of I/O requests, an operations statistics management section, and an error management section. PowerPath teaches of logical units assigned to a physical device (*page 2-6 figure 2-3*). Shank et al. teaches a path selection section which selects a path assigned with a data input/output request transmitted to said storage (*column 6 lines 11-13*), an I/O transmission/reception section which transmits a data input/output request issued to a path selected by said path selection section (*column 6 lines 13-15*), an operation statistics management section which totals process states of normally terminated data input/output requests (*column 7 lines 20-24*), and an error management section which detects an error occurred on said path, specifies a type of said error, and totals the number of detected errors for each path and error type (*column 7 lines 45-51, where the tally is interpreted as a total*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the logical storage units as taught by PowerPath in the invention of Lim. This would have been obvious because the use of PowerPath is taught in the invention of Lim (*column 1 line 63*). Further, PowerPath offers a variety of benefits (*page 2-2*) to enhance the fault tolerance of the invention of Lim.

It would have been obvious to a person skilled in the art at the time the invention was made to have included the additional limitations as taught by Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

As in claim 11, the combined invention of Lim and PowerPath teaches of the limitations of claim 10, including an error detection section and a changeover evaluation section. However, the combined invention of Lim and PowerPath fails to teach of the remainder of the limitations of claim 11. Shank et al. teaches an error detection section specifies a type of said detected error (*column 7 lines 45-51*); and a server changeover evaluation section changes the number of paths as a criterion for changing said information processing apparatus according to said specified error type (*column 7 lines 45-55*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the type of error specification and number of path criterion as taught by

Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

As in claim 12, the combined invention of Lim and PowerPath teaches of the limitations of claim 10, including an error detection section and a changeover evaluation section. However, the combined invention of Lim and PowerPath fails to teach of the remainder of the limitations of claim 12. Shank et al. teaches an error detection section specifies a type of said detected error (*column 7 lines 45-51*); and a server changeover evaluation section uses a combination of said plurality of specified types of errors to determine whether or not to change said information processing apparatus (*column 7 lines 36-55, where it is interpreted that once the tally of error types reaches a threshold, the information processing apparatus will be changed*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the type of error specification and plurality of error types as taught by Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

As in claim 15, the combined invention of Lim and PowerPath teaches of the limitations of claim 14, including an error detection section and a changeover evaluation section. However, the combined invention of Lim and PowerPath fails to teach of the remainder of the limitations of claim 15. Shank et al. teaches specifying a type of said detected error (*column 7 lines 45-51*); and changing the number of paths as a criterion for changing said information processing apparatus according to said specified error type (*column 7 lines 45-55*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the type of error specification and number of path criterion as taught by Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

As in claim 16, the combined invention of Lim and PowerPath teaches of the limitations of claim 14, including an error detection section and a changeover evaluation section. However, the combined invention of Lim and PowerPath fails to teach of the remainder of the limitations of claim 16. Shank et al. teaches specifying a type of said detected error (*column 7 lines 45-51*); and using a combination of said plurality of specified types of errors to determine whether or not to change said information processing apparatus (*column 7 lines 36-55, where it is interpreted that once the tally of error types reaches a threshold, the information processing apparatus will be changed*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the type of error specification and plurality of error types as taught by Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

As in claim 20, the combined invention of Lim and PowerPath teaches of the limitations of claim 19, including an error detection section and a changeover evaluation section. However, the combined invention of Lim and PowerPath fails to teach of the remainder of the limitations of claim 20. Shank et al. teaches of means for specifying a type of said detected error (*column 7 lines 45-51*); and means for changing the number of paths as a criterion for changing said information processing apparatus according to said specified error type (*column 7 lines 45-55*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the type of error specification and number of path criterion as taught by Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

As in claim 21, the combined invention of Lim and PowerPath teaches of the limitations of claim 19, including an error detection section and a changeover evaluation section. However, the combined invention of Lim and PowerPath fails to teach of the remainder of the limitations of claim 21. Shank et al. teaches of means for specifying a type of said detected error (*column 7 lines 45-51*); and means for using a combination of said plurality of specified types of errors to determine whether or not to change said information processing apparatus (*column 7 lines 36-55, where it is interpreted that once the tally of error types reaches a threshold, the information processing apparatus will be changed*).

It would have been obvious to a person skilled in the art at the time the invention was made to have included the type of error specification and plurality of error types as taught by Shank et al. in the combined invention of Lim and PowerPath. This would have been obvious because the invention of Shank et al. allows for fault tolerance over an array of storage systems (*column 2 lines 7-10, and column 4 line 63 through column 5 line 4*). Further, the invention of Shank et al. offers similarities to the combined invention of Lim and PowerPath, such as multiple path failover and load balancing in a virtual storage environment.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 6,542,944 D'Errico discloses load balancing. U.S. Patent No. 5,944,838 Jantz discloses path failover. U.S. Patent No. 6,341,356 Johnson et al. discloses path

failover and load balancing. U.S. PGPub 2004/0078632 Infante et al. discloses path error types. U.S. PGPub 2004/0117441 Liu et al. discloses path failover with logical units.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Contino whose telephone number is (571) 272-3657. The examiner can normally be reached on Monday-Friday 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PFC
01/18/2006



SCOTT BADERMAN
SUPERVISORY PATENT EXAMINER